

10/580988

GUNN & APT 25 MAY 2006

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P-17.164 (PCT)  
SwRI ID #3110

May 25, 2006

Mail Stop PCT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

RE: PCT Application entitled "Method for the Simultaneous Desulfation of a Lean NO<sub>x</sub> Trap and Regeneration of a Diesel Particulate Filter" by Yiqun Huang, et al.

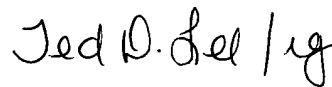
Dear Sir:

Enclosed please find the following items for filing on the above referenced PCT application:

Response to PCT Written Opinion with Certificate of Mailing

Please stamp the enclosed acknowledgment card with the date of receipt and return to my office.

Sincerely,



Ted D. Lee

TDL/ig  
Enclosures  
cc: Joseph C. Arrambide  
Bob McFall

**10/580988**

**AP20 Rec'd PCT/PTO 25 MAY 2006**

Attorney's Docket Number: P-17.164(PCT)

TRANSMITTAL LETTER TO THE UNITED STATES RECEIVING OFFICE (RO/US)

International Application No.

International Filing Date

Priority Date Claimed

PCT/US05/23527

01 July 2005

04 October 2004

Title of the Invention: Method for the Simultaneous Desulfation of a Lean No<sub>x</sub> Trap and Regeneration of a Diesel Particulate Filter

Applicant(s) for RO/US

**Mail Stop PCT  
Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450**

**RESPONSE TO PCT WRITTEN OPINION**

Dear Madam:

Method Claims 1-9 were presented for examination.

Enclosed in response to the Written Opinion in the International Application, mailed 06 April 2006, is the following:

It was noted by Examiner that Claims 1, 4, 8 and 9 lacked an inventive step under PCT Article 33(3) as being obvious over Xu et al. (2004/0083719). Further, Examiner noted that Claims 5-7 lacked an inventive step under PCT Article 33(3) as being obvious over Xu et al. As applied to Claim 1 above, in view of Takahashi et al. (6,237,330). Applicant does not believe these cited references pertain to the present invention and believes the present Claims provide the required inventive step and are not obvious in light of these references.

Claims 2 and 3 were objected to, but indicated to be allowable if rewritten in independent form.

**A. Differences Between Independent Claim 1 and Xu Reference**

In the rejection of Independent Claim 1, the Examiner stated the following:

“Xu, et al, however, failed to disclose the first operating condition is rich combustion mode and the second operating condition is lean combustion mode.”

Applicant agrees with that statement. In fact, Xu, et al separates the cylinders into two groups with each group operating independently as is indicated in the following language of the “Abstract” of Xu, et al:

“One group cylinders feed exhaust gases to one exhaust after treatment device and

another group of cylinders feed exhaust gases to another exhaust after treatment device. By operating the groups of cylinders at different operating conditions, the desired temperature in one of the exhaust after treatment devices can be achieved while also providing driver demanded torque.”[emphasis added]

The present invention has nothing to do with operating different group of cylinders at different operating conditions.

Independent Claim 1 specifically claims “alternatingly operating said engine in a lean combustion mode and said desired rich combustion mode for respective predefined periods of time.” This claim limitation as claimed in Independent Claim 1 is not suggested in Xu as contended by the Examiner. In fact, Xu teaches away from the “alternatingly operating said engine in a lean combustion mode and said desired rich combustion mode,” but instead has two different groups of cylinders that are operating differently.

None of the references cited by the Examiner suggest the alternating operation of an engine between lean and rich combustion mode.

Independent Claim 1 further claims the period for the operation of the lean combustion mode and the rich combustion modes “being of a frequency and duration sufficient to increase said substrate temperature of the lean NO<sub>x</sub> trap.” This limitation is not suggested in the references cited by the Examiner.

By the alternating operation of the engine between the lean combustion mode and the rich combustion mode which increases the substrate temperature, “said sulfur accumulations stored in the lean NO<sub>x</sub> trap are reduced and said Diesel particulate trap is simultaneously regenerated.” This is also claimed in independent Claim 1.

The difference between the Xu, et al reference and Independent Claim 1 resides in the alternating operation of the engine between the lean combustion and the rich combustion mode. That is not done in Xu, et al. In fact, Xu et al operates two different groups of cylinders differently, which is not being claimed in the Independent Claim 1 of the present invention.

The methods used for raising the temperature of the Diesel Particulate Filter (DPF) and the Lean NO<sub>x</sub> trap (LNT) are different between the present claimed invention and Xu’s patent. The present claimed invention uses alternate switching between rich and lean combustion mode and Xu uses two groups of cylinders, one group operating at high torque. These two methods are totally different. The method used by applicant, and contained in Independent Claim 1, is not shown nor suggested by Xu.

For the reasons given herein above, Independent Claim 1 should be allowed. With the allowance with Independent Claim 1, Dependent Claims 4, 8, and 9 should also be allowed.